

The following lesson is on Pollination. The objectives for this lesson are for students to be able to explain the relationship between nectar, pollen, and the pollinator. Students will also identify the reproductive parts of the flower.

Grade level: 5-6

Pollination

Objectives: >Students will be able to explain the relationship between nectar, pollen, and the pollinator. >Students will identify the important reproductive parts of the flower.

Materials: Bouquet of flowers
Diagram of the reproductive parts of the flower
Tweezers to aid in dissection
Tube socks (at least three)
Sugar cubes
Talc powder

Motivation: Using many examples from the flowers in the bouquet of flowers, the teacher can differentiate the many different sizes, shapes and colors of flower.

Activity: 1. students will be given the diagram of the reproductive parts of the flower.
2. arrange the samples of flowers in pairs of two (one for observation, the other for dissection).
3. using tweezers, students dissect and label the respective parts of the flower.
4. students rotate to a new station to see the varieties and similarities of the different examples in the class.

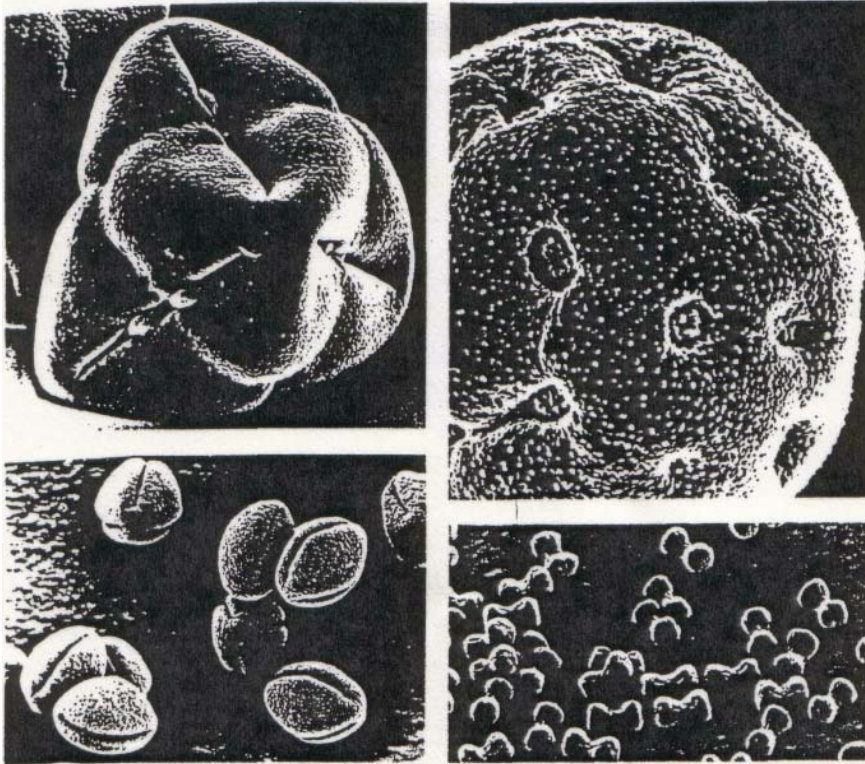
Procedure and/or lecture information:

1. Reproduction requires the transfer of pollen (blueprint information) from one plant to the next.
2. Plants generally need help to transfer the pollen dust. This help is known as the pollinator. For example, the bumble bee is the pollinator for the red clover. When the bee flies from plant to plant, he inadvertently carries the pollen with him.
3. Does the pollinator fly around trying to help the plants out? Not really, since the pollinator is actually looking for food within the flower. The food is a sugary substance called nectar.
4. When he buzzes around on the flower, sucking up nectar, he inadvertently "*gets pollen on hisfeets.*"

Activity: 1. coat the inside of the tube socks with talc powder.
2. drop a handful of sugar cubes in each sock.
3. a few student volunteers come to the front to perform a task ...
4. the student will reach in each sock, pulling out a sugar cube ... then again, and again ... three socks, three cube

5. If we think of the sock as the flower, then the pollen is the dust, and the sugar cubes are the nectar.
6. It is not possible to get the sugar without getting the power on the hand and arm. Moving from sock to sock mixes the dust from each sock. The flower works the same way.

7. Pollinators and their respective choice of flower have adapted to each other to create a symbiotic relationship that is beneficial to both the flower and the pollinator.
8. How does a flower attract the bee? Scent is one attraction, other attractors include the size and shape of the flower or if it *"looks real bright."*
9. Pollinators for some plants are flying insects. In other cases the pollinator is a butterfly or a bird (ingests and excretes the seed), or the wind. These are examples of cross-pollination. In harsh conditions where the pollinators are missing, plants have adapted solutions that involve pollination within the same flower (self pollination). The risk of extinction outweighs the risk of mutation due to inbreeding.



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Flowers, Pollination and Fertilization

Flowers are among the most complex and diversified objects in the plant kingdom; that is a great part of their fascination. But underlying this complexity and diversity there is much common ground - a large measure of unity and regularity in their structure. Some appreciation of this is needed to understand how flowers work,

and in describing their structure some technical terms can hardly be avoided. This chapter, then, is background: an introduction to the essential features of flowers relevant to pollination, and in effect a discursive glossary. You may like to leave it aside, and refer to it only as needed to clarify matters considered in later chapters.

What is a flower?

It is generally much easier to recognize a flower as such than to give a definition of what a flower is. Typically, a flower is made up of four kinds of members: *sepals*, making up the *calyx*, *petals*, forming the *corolla*; *stamens*, sometimes collectively referred to as the *androeceum*; and the *ovary* or *gynoecium*, made up of one or more *carpels*. These are borne on the *receptacle* - the conical or thickened end of the flower-stalk or *pedicel*. Thus in the flower of a buttercup (Fig. 2.1) there are five green sepals, which enclose and protect the developing bud, and five glossy yellow petals, each with a minute flap-like *nectar* at the base, which form the most conspicuous part of the flower. Next, there are a large number of stamens, each consisting of *filament* bearing an *anther*

which will open to release the powdery yellow *pollen*. Finally, in the centre of the flower there is a cluster of carpels, each one with a receptive *stigma* at the tip, and each containing an *ovule*, which, after fertilization, can develop into a *seed*.

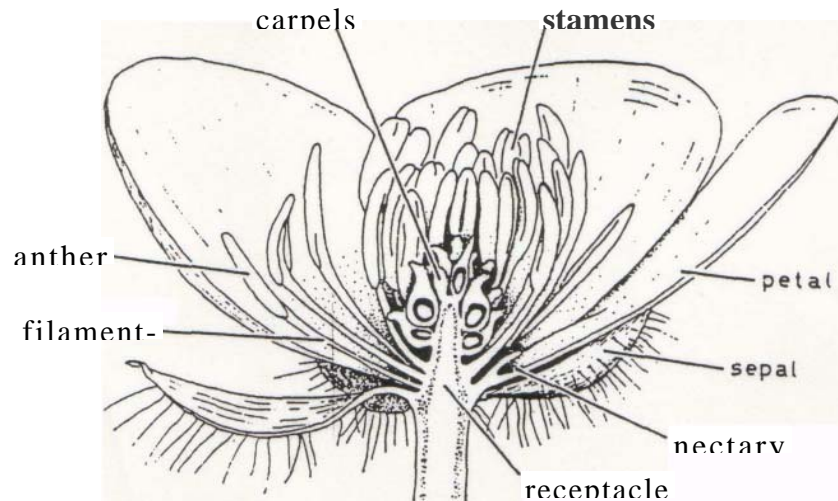


Fig. -1 Half MTion of a bmtercup flower, *Ranunculus repms*.

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